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1 Routine/Function Prologues

1.0.1 getgrad.F90 (Source File: getgrad.F90)

Opens, reads, interpolates and overlays radiation forcing.

TIME1 = most recent past data TIME2 = most recent future data

REVISION HISTORY:

```

28 Oct 1999: Brian Cosgrove; Initial code, see getrad.f
27 Apr 2000: Brian Cosgrove' Disabled zenith angle correction cutoff for
              cos(zen) less than .2
11 May 2000: Brian Cosgrove; Enabled correction cutoffs for cos(zen) less
              than .1, stop model if computed value is greater than 1367 w/m2
08 Jan 2001: Brian Cosgrove; Added check to see if czb or czm is equal
              to zero before trying to divide by czm or czb. If it is
              zero, set radiation value to zero
06 Mar 2001: Brian Cosgrove; Changed computation of WT1 and WT2 in cases
              where the previous hour or the next hour of observed radiation
              is not available. Substituted TIME1 for LDAS%PINKTIME1 and
              LDAS%NESTIME1 and TIME2 for LDAS%PINKTIME2 and LDAS%NESTIME2
15 Jun 2001: Urszula Jambor; Reworked algorithm for AGRMET data & GLDAS.
15 Oct 2001: Jesse Meng; Replace lis%agrmet flag by lis%agrmetsw and
              lis%agrmetlw; added call retagrlw() to calculate
              AGRMET LW;
25 Feb 2002: Urszula Jambor; check on both SW & LW file status before
              using
04 Jun 2002: Urszula Jambor; allowed fall back to model SW.
10 Dec 2002: Urszula Jambor; replaced lis%astat1,2 with local sstat1,2
              Reorganized routine to mirror other get-routines, and
              corrected bug in file status check for initial time1.

```

INTERFACE:

```
subroutine getgrad
```

USES:

```

use lisdrv_module, only : lis, grid
use obsradforcing_module, only : obswdata1,obswdata2,oblwdata1,oblwdata2,&
      sstat1,sstat2,lstat1,lstat2
use time_manager
use time_module
use agrmetdomain_module, only : agrmetdrv
#if ( defined OPENDAP )
  use agrmetopendap_module, only : set_agrmet_index
  use spmdMod
#endif

implicit none

```

CONTENTS:

```
!-----
! Determine Required Observed Radiation Data Times
!-----
yr1 = lis%t%yr      !Previous Hour
mo1 = lis%t%mo
da1 = lis%t%da
hr1 = lis%t%hr
mn1 = 0
ss1 = 0
ts1 = 0
call tick ( time1, doy1, gmt1, yr1, mo1, da1, hr1, mn1, ss1, ts1 )

yr2 = lis%t%yr      !Next Hour
mo2 = lis%t%mo
da2 = lis%t%da
hr2 = lis%t%hr
mn2 = 0
ss2 = 0
ts2 = 60*60
call tick ( time2, doy2, gmt2, yr2, mo2, da2, hr2, mn2, ss2, ts2 )

lis%f%findagrtime1=0
lis%f%findagrtime2=0
movetime=0

if(lis%t%time.ge.agrmetdrv%agrmttime2) then
  movetime=1
  lis%f%findagrtime2=1
endif

#if ( defined OPENDAP )
  if ( masterproc ) then
    nstep = get_nstep()
  endif
  call MPI_BCAST(nstep, 1, MPI_INTEGER, 0, MPI_COMM_WORLD, ierr)
#else
  nstep = get_nstep()
#endif

if ( nstep == 0 .or. nstep == 1 ) then
  lis%f%findagrtime1 = 1
  lis%f%findagrtime2 = 1
  movetime = 0
endif

if ( lis%f%findagrtime1 == 1 ) then
```

```

#ifndef ( defined OPENDAP )
    call set_agrmet_index(0)
#endif
    sstat1 = 0
    sstat2 = 0
    lstat1 = 0
    lstat2 = 0
    call agrSWfile ( nameSH, lis, yr1, mo1, da1, hr1 )
    print*, 'calling swfile.. ',nameSH
    sstat1 = 0
    call retglbSW ( 1, nameSH, sstat1, 1 )
    lstat1 = 0
    call retagrlw ( 1, yr1, mo1, da1, hr1, lstat1, 1 )
    if ((sstat1 + lstat1) < 2) then
        sstat1 = 0
        lstat1 = 0
    end if
    if (sstat1 /= 0) agrmetdrv%agrmtime1 = time1
endif
if ( movetime == 1 ) then
    agrmetdrv%agrmtime1 = agrmetdrv%agrmtime2
    sstat1 = sstat2
    lstat1 = lstat2
    do c=1, lis%d%ngrid
        obswdata1(c) = obswdata2(c)
        oblwdatal(c) = oblwdatal(c)
    end do
endif

if ( lis%f%findagrtimel == 1 ) then
#ifndef ( defined OPENDAP )
    call set_agrmet_index(1)
#endif
    sstat2 = 0
    lstat2 = 0
    call agrSWfile ( nameSH, lis, yr2, mo2, da2, hr2 )
    sstat2 = 0
    call retglbSW ( 2, nameSH, sstat2, 1 )
    lstat2 = 0
    call retagrlw ( 2, yr2, mo2, da2, hr2, lstat2, 1 )

    if ((sstat2 + lstat2) < 2) then
        sstat2 = 0
        lstat2 = 0
    end if
    if (sstat2 /= 0) agrmetdrv%agrmtimel = time2
endif
!-----

```

```

! Print out Status of data holdings
!-----
if (lis%t%time == time1) then
  if (sstat1==0) write(*,*) 'NO AGR SW USED',mo1,da1,yr1,hr1
  if (sstat1/=0) write(*,*) 'USED AGRMET SW',mo1,da1,yr1,hr1
  if (sstat2==0) write(*,*) 'NO AGR SW USED',mo2,da2,yr2,hr2
  if (sstat2/=0) write(*,*) 'USED AGRMET SW',mo2,da2,yr2,hr2

  if (lstat1==0) write(*,*) 'NO AGR LW USED',mo1,da1,yr1,hr1
  if (lstat1/=0) write(*,*) 'USED AGRMET LW',mo1,da1,yr1,hr1
  if (lstat2==0) write(*,*) 'NO AGR LW USED',mo2,da2,yr2,hr2
  if (lstat2/=0) write(*,*) 'USED AGRMET LW',mo2,da2,yr2,hr2
endif
return

```

1.0.2 agrSWfile: (Source File: getgrad.F90)

This subroutine puts together the radiation data filenames.

REVISION HISTORY:

```

28 Oct 1999: Brian Cosgrove; Initial code
18 Jun 2001: Urszula Jambor; Modified for AGRMET data use in GLDAS
24 Oct 2001: Jesse Meng; Modified for AGRMET directory structure
15 Aug 2003: Sujay Kumar: Modified to create a global filename
                  instead of two filenames for each hemisphere.

```

INTERFACE:

```
subroutine agrSWfile ( nameSH, lis, yr, mo, da, hr )
```

USES:

```

use lis_module
use agrmetdomain_module, only : agrmetdrv

```

CONTENTS:

```

92 format (80a1)
93 format (a80)
94 format (a5, i4, i2, i2, i2)
95 format (15a1)
96 format (a40)
97 format (a1)
98 format (a6, i4, i2, a1)
99 format (13a1)

```

```
open(unit=81, file='temp', form='formatted', access='direct', recl=80)
```

```
write(81,96,rec=1) agrmetdrv%agrmetdir
read(81,92,rec=1) (fbase(i), i=1,80)

write(81,98,REC=1) '/SWDN/' ,yr,mo,'/
read(81,99,rec=1) fdir
do i = 1, 13
  if ( fdir(i) == ' ') fdir(i) = '0'
end do
write(81,94,rec=1) 'swdn_', yr, mo, da, hr
read(81,95,rec=1) ftime
do i = 1, 15
  if ( ftime(i) == ' ') ftime(i) = '0'
end do
c = 0
do i = 1, 80
  if ( (fbase(i) == ' ') .and. (c == 0) ) c = i-1
end do

write(81, 92, rec=1) (fbase(i),i=1,c), (fdir(i),i=1,13), &
(ftime(i),i=1,15)
read(81, 93, rec=1) nameSH
close(81)

return
```